Herbicide Residues in Fish Tissues

Brian Finlayson
Pesticide Investigations Unit
California Department of Fish and Game

Evaluation of Herbicides

- 1999
  - hexazinone
  - sulfometuron-methyl
  - glyphosate
  - triclopyr
  - 2,4-D
  - atrazine
- 2000
  - atrazine
  - hexazinone
  - triclopyr
  - hexazinone

Assessment Factors

- Water solubility
- Persistence
- BCF (biological concentration factor)
- Application technique

Atrazine

- Low BCF (<100)
- Slightly water soluble (28 ppm)
- Retention of herbicide residues (easily absorbed)
- Highly persistent in water and soil (> 1 yr)
- Ground application

2,4-D

- Ester forms have relatively high BCF
- Easily absorbed by organisms
- Chronic toxicity in mammals (cancer/birth defects)
- Low conc found in surface water
- Not persistent
- Aerial application

Triclopyr

- Highly soluble in water
- BCF for ester formulations may be high
- Low persistence in organisms
- Detected in 2,4-D analysis (free)

Sample Parameters

- whole body analyses
- resident riffle sculpin (composite)
- young-of-year salmonids (composite)
- 10 samples per site per species
- double wrapped in aluminum foil
- dry ice shipment
- late spring (following applicat1on)

Analyses

- $750/sample for 2,4-D and triclopyr
- $750/sample for atrazine
- 100 grams per sample
- QA/QC procedures
  - duplicate analyses
  - matrix spikes